

CLAIMS

1. (Original) An improved field display device comprising:
an array of nanotips formed from an array of defects in a crystalline material; and
a transparent plate positioned over the array of nanotips, the transparent plate to produce light when receiving electron emissions from the nanotips.
2. (Original) The improved display device of claim 1 wherein each defect in the array of defects forms a column structure oriented in a direction perpendicular to a plane formed by an interface between the crystalline material and a substrate.
3. (Original) The improved field display device of claim 1 wherein the crystalline material is a hexagonal crystalline material.
4. (Original) The improved field display device of claim 3 wherein the hexagonal crystalline material is a semiconductor.
5. (Original) The improved field display device of claim 4 wherein the semiconductor is Gallium Nitride.
6. (Original) The improved field display device of claim 1 wherein the nanotips are coated with a metal.
7. (Original) The improved field display device of claim 6 wherein the metal is a low work function metal.
8. (Original) The improved field display device of claim 4 wherein the semiconductor is a highly doped semiconductor.

Claims 9-13 (Cancelled).

14. (New) The improved display device of claim 1 further comprising:
a substrate, wherein the formation of the crystalline material over the substrate induces a homogeneous array of dislocations to form said array of defects.

15. (New) The improved display device of claim 14 wherein the nanotips are formed by etching the crystalline material leaving nanotips at the site of each defect in the array of defects.

16. (New) The improved display device of claim 1 further comprising:
a conformal dielectric layer formed over the crystalline material.

17. (New) The improved display device of claim 1 wherein the transparent plate is a glass sheet.

18. (New) The improved display device of claim 1 further comprising:
electrical contacts connected to the nanotips to allow a driver circuit to apply a voltage to each nanotip, the voltage high enough to cause the ejection of electrons from each nanotip.

19. (New) The improved display device of claim 1 further comprising:
a hexagonally symmetric crystalline substrate, wherein the crystalline material is a hexagonal crystalline material such that the growth of the crystalline material upon the hexagonally symmetric crystalline substrate results in defects perpendicular to the crystalline material and crystalline substrate interface.

20. (New) The improved display device of claim 19 wherein the crystalline substrate is sapphire substrate.

21. (New) The improved display device of claim 20 wherein the crystalline material is Gallium nitride.

22. (New) The improved display device of claim 2 wherein each column structure of defects positioned along an approximate center of a corresponding nanotip:

23. (New) The improved display device of claim 1 wherein the defects are dislocations.

24. (New) An improved field display device comprising:
a substrate;
an array of crystalline nanotips formed over the substrate, each crystalline nanotip in the array of crystalline nanotips surrounding a corresponding column of dislocation defects; and,
a transparent plate positioned over the array of nanotips, the transparent plate to produce light when receiving electron emissions from the nanotips.